SUPPORTING STATEMENT

Examinations & Testing of Electrical Equipment Including Exam, Testing, and Maintenance of High Voltage Longwalls - 30 CFR 18.53, 75.351,75.512, 75.703, 75.800, 75.820, 75.821, 75.900, 75.1001-1, 77.502, 77.800, 77.900

A. JUSTIFICATION

1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and of each regulation mandating or authorizing the collection of information.

The Federal Mine Safety and Health Act of 1977 (Act) and 30 CFR, Parts 75 and 77, Mandatory standards for coal mines make the collection of information necessary.

It has long been known that inadequate maintenance of electric equipment is a major cause of serious electrical accidents in the coal mining industry. It is imperative that mine operators adopt and follow an effective maintenance program to ensure that electric equipment is maintained in a safe operating condition if electrocutions, mine fires, and mine explosions are to be prevented. The subject regulations require the mine operator to establish an electrical maintenance program by specifying minimum requirements for the examination, testing, and maintenance of electric equipment.

(a) Examinations of Electric Equipment

(1) 30 CFR Part 75, Section 75.512, requires that all electric equipment be frequently examined, tested and maintained by a qualified person to assure safe operating conditions and that a record of such examinations be kept. 30 CFR Part 75, Section 75.512-2, specifies that the required examinations and tests be conducted at least weekly.

(2) 30 CFR Part 75, Section 75.703-3(d)(11), specifies that all grounding diodes be tested, examined and maintained as electric equipment in accordance with the provisions of 30 CFR Section 75.512.

(3) 30 CFR Part 77, Section 77.502, requires that electric equipment be frequently examined, tested and maintained by a qualified person to ensure safe operating conditions and that a record of such examinations be kept. 30 CFR Part 77

Section 77.502, specifies that the required examinations and tests be conducted at least monthly.

(b) Examinations of High-Voltage Circuit Breakers

(1) 30 CFR Part 75, Section 75.800 requires that circuit breakers protecting high-voltage circuits which enter the underground area of a coal mine be properly tested and maintained as prescribed by the Secretary. 30 CFR Part 75, Section 75.800-3, requires that such circuit breakers be tested and examined at least once each month. Section 75.800-4, specifies that a record of the required examinations and tests be kept.

(2) Section 18.53(h) requires a study to determine the minimum available fault current be submitted to MSHA to ensure adequate protection for the length and conductor size of the longwall motor, shearer and trailing cables.

(3) Sections 75.820, and 75.821 contain minimal requirements for troubleshooting, testing, examination and maintenance of high-voltage longwalls. These important requirements track tests, examination, and maintenance conducted on high-voltage longwall systems to reduce fire, electrical shock, ignition and operational hazards.

(4) 30 CFR Part 77, Section 77.800, requires that circuit breakers protecting high-voltage circuits which supply power to portable or mobile equipment be properly tested and maintained. Section 77.800-1, requires that such circuit breakers be tested and examined at least once each month. 30 CFR Part 77, Section 77.800-2, specifies that a record of the required examinations and tests be kept.

(c) Examinations of Low- and Medium-Voltage Circuit Breakers

(1) 30 CFR Part 75, Section 75.900, requires that circuit breakers protecting low- and medium-voltage power circuits serving three-phase alternating-current equipment be properly tested and maintained. 30 CFR Part 75, Section 75.900-3, requires that such circuit breakers be tested and examined at least once each month. Section 75.900-4, specifies that a record of the required examinations and tests be kept.

(2) 30 CFR Part 77, Section 77.900, requires that circuit breakers protecting low- and medium-voltage circuits which supply power to portable or mobile three-phase alternating-current equipment be properly tested and maintained.

30 CFR Part 77, Section 77.900-1, requires that such circuit breakers be tested and examined at least once each month. Section 77.900-2, specifies that a record of the required examinations and tests be kept.

(d) Tests and Calibrations of Automatic Circuit Interrupting Devices

30 CFR, Part 75, Section 75.1001-1(b), requires that automatic circuit interrupting devices, which protect trolley wires and trolley feeder wires, be tested and calibrated at intervals not to exceed six months. Section 75.1001-1(c), specifies that a record of the required tests and calibrations be kept.

(e) Test and Calibration of Atmospheric Monitoring Systems

30 CFR Part 75, Sections 75.351 (f)(1), (2), (3), and (4), require testing and calibration of sensors every 31 days. Section 75.351 (h), specifies that a record must be made of signal device or alarm activations showing date, time, type of sensor, the maximum concentration detected at the sensor producing the signal and the reason for activation.

2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.

The respondents for the paperwork provisions of the subject regulations are coal mine operators. The records of tests and examinations are reviewed by coal miners, coal mine officials, and MSHA and State inspectors. The records are intended to indicate whether examinations and tests were conducted and give insight into the hazardous conditions that have been encountered and those that may be encountered. These records greatly assist those who use them in making decisions that will ultimately affect the safety and health of miners.

Miners examine the records to determine if electric equipment is safe to operate and to determine if reported safety defects have been corrected. Mine officials examine the records to evaluate the effectiveness of their electrical maintenance programs, to determine that the required tests and examinations have been conducted, and to determine if reported safety defects have been

corrected. MSHA and State inspectors review the records to determine if the required tests and examinations have been conducted and to identify units of electric equipment that may pose a potential safety hazard, and to evaluate the effectiveness of the coal mine operator's electrical maintenance programs. By comparing the records with the actual condition of electric equipment, MSHA inspectors may, in some cases, be able to identify weaknesses in the coal mine operator's electrical maintenance programs and require that these weaknesses be corrected.

3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also describe any consideration of using information technology to reduce burden.

Mine operators may retain the records in whatever method they choose, which may include utilizing computer technology. The subject regulations do not specify how the required records must be kept. They could be kept in the traditional manner or stored electronically, provided they are secure and not susceptible to loss or alteration. No improved information technology has been identified that would reduce the burden.

4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purpose(s) described in 2 above.

MSHA knows of no other Federal or State reporting requirements that would duplicate the reporting requirements contained in this final rule.

5. If the collection of information impacts small businesses or other small entities (Item 5 of OMB Form 83-I), describe any methods used to minimize burden.

This information does not have a significant impact on small businesses or other small entities. However, MSHA has made available on its web-site various sources of information, such as “Technical Assistance,” “Best Practices,” and an “Accident Prevention” site to assist with compliance. These provide tips

and general information on a number of various topics.

6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

Because of fire, electrocution and explosion hazards in coal mines, mine operators are required to comply with these paperwork provisions. Reduction of these requirements could result in increased hazards to miners. A reduction in the frequency of examinations and tests could allow existing unsafe conditions to develop, jeopardizing the safety of miners.

7. Explain any special circumstances that would cause an information collection to be conducted in a manner:

- **requiring respondents to report information to the agency more often than quarterly;**
- **requiring respondents to prepare a written response to a collection of information in fewer than 30 days after receipt of it;**
- **requiring respondents to submit more than an original and two copies of any document;**
- **requiring respondents to retain records, other than health, medical, government contract, rant-in-aid, or tax records for more than three year**
- **in connection with a statistical survey, that is not designed to produce valid and reliable results that can be generalized to the universe of study;**
- **requiring the use of a statistical data classification that has not been reviewed and approved by OMB;**
- **that includes a pledge of confidentiality that is not supported by authority established in statute or regulation, that is not supported by disclosure and data security policies that are consistent with the pledge, or which unnecessarily impedes sharing of data with other agencies for compatible confidential use; or**

- **requiring respondents to submit proprietary trade secret, or other confidential information unless the agency can demonstrate that it has instituted procedures to protect the information's confidentiality to the extent permitted by law.**

Collection of information is consistent with the guidelines in 5 CFR 1320.5.

8. If applicable, provide a copy and identify the data and page number of publication in the Federal Register of the agency's notice, required by 5 CFR 1320.8(d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden. Describe efforts to consult with persons outside the agency to obtain their views on the availability of data, frequency of collection, the clarity of instructions and recordkeeping, disclosure, or reporting format (if any), and on the data elements to be recorded, disclosed, or reported. Consultation with representatives of those from whom information is to be obtained or those who must compile records should occur at least once every 3 years -- even if the collection of information activity is the same as in prior periods. There may be circumstances that may preclude consultation in a specific situation. These circumstances should be explained.

In accordance with 5 CFR 1320.8 (d), MSHA will publish the proposed information collection requirements in the Federal Register, notifying the public that these information collection requirements are being reviewed in accordance with the Paperwork Reduction Act of 1995, and giving interested persons 60 days to submit comments.

9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

MSHA has not provided payments or gifts to the respondents.

10. Describe any assurance of confidentiality provided to respondents and the basis for the assurance in statute,

regulation, or agency policy.

There are no records requiring confidentiality.

11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior and attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons form whom the information is requested, and any steps to be taken to obtain their consent.

There are no questions of a sensitive nature.

12. Provide estimates of the hour burden of the collection of information. The statement should:

- **Indicate the number of respondents, frequency of response, annual hour burden, and an explanation of how the burden was estimated. Unless directed to do so, agencies should not conduct special surveys to obtain information on which to base hour burden estimates. Consultation with a sample (fewer than 10) of potential respondents is desirable. If the hour burden on respondents is expected to vary widely because of differences in activity, size, or complexity, show the range of estimated hour burden, and explain the reasons for the variance. Generally, estimates should not include burden hours for customary and usual business practices.**

- **If this request for approval covers more than one form, provide separate hour burden estimates for each form and aggregate the hour burdens in Item 13 of OMB Form 83-I.**
- **Provide estimates of annualized cost to respondents for the hour burdens for collections of information, identifying and using appropriate wage rate categories. The cost of contracting out or paying outside parties for information collection activities should not be included here. Instead, this cost should be included in Item 13.**

Section 18.53(h) requires that a study (to determine the minimum available fault current to ensure adequate protection for the length and conductor size of the longwall motor, shearer and

trailing cables) be submitted to MSHA. MSHA estimates that it will take an engineer (earning $40.97 an hour in 2002) an average of 1 hour to conduct this study and produce a 4 page report of the results.

MSHA assumes that three new high-voltage longwall units will open each year. Therefore, each year the burden hours to conduct the fault current test will be 3 hours (1 hour x 3 longwall units).

1 hour x 3 Longwalls = 3 hours
3 hours x $40.97 = $122.97

MSHA estimates it will take a clerical worker (earning $20.39 an hour in 2002) 6 minutes to copy the report (required by Section 18.53(h)) and mail it to MSHA. Each year the burden hours and costs for submitting the report to MSHA are 0.3 hours (0.1 hours x 3 longwall units) and $6.12 (0.1 hours x 3 longwall units x $20.39) respectively.

0.1 hours x 3 longwalls = 0.3 hours
0.3 hours x $20.39 = $6.12

MSHA estimates that it will take an electrician (earning $29.83 an hour in 2002) an average of 5 minutes to lock out and tag a disconnecting device as specified in §75.820(b) and (e) and that an average of one lock out and tag will occur each day at each longwall unit. Therefore, assuming 50 workweeks per year, the annual burden hours will be 1,452.5 hours (0.08333 hours x 350 days/year x 50 longwall units). The annual burden costs will be $43,328 (1,452.5 x $29.83).

0.08333 hours x 350 days x 50 longwall units = 1,452.5 hours
1,453 hours x $29.83 = $43,328

MSHA assumes that it will take an electrician (earning $29.83 an hour) one hour per week to test and examine each unit of high-voltage longwall equipment and circuits under §75.821(d). Assuming 50 work weeks per year and 50 longwall units, the total annual burden hours for examining equipment and circuits will be 2,500 hours (1 hour x 50 weeks/year x 50 longwall units). The total annual burden costs will be $74,575 (2,500 hours x $29.83)

1 hour x 50 weeks/year x 50 longwall units = 2,500 hours
2,500 hours x $29.83 = $74,575

§75.821(d) also requires the electrician to certify by signature and date that the above examinations have been conducted and to

make a record of any unsafe conditions found and any corrective action taken. MSHA assumes it will take the electrician 0.5 hours to produce this record and certify that the examination has been conducted. Therefore, the annual burden hours for recording and certifying will be 1,250 hours (0.5 hours x 50 weeks/year x 50 longwall units). The annual burden costs will be $37,288 (1,250 x $29.83).

0.5 hours x 50 weeks/year x 50 longwall units = 1,250 hours
1,250 hours x $29.83 = $37,288

The total annual net burden hours and costs for the standards are given in Table 1. The total burden hours and costs each year will be 5,206 hours and $155,320 respectively.

Table 1

Cite/ Reference	Annual Burden Hours for Each Year	Annual Burden Costs for Each Year
Section 18.53(h)	3.3	$ 129
Section 75.820(b) and (e)	1,452.5	$ 43,328
Section 75.821(d)	3,750	$ 111,863
Total	**5,205.8**	**$ 155,320**

Examinations of Electric Equipment

The number of respondents, frequency of response, and burden hours are shown on Table 2. The burden was determined using the average salary of $58.96 per hour for a mine supervisor (U.S. Coal Mine Salaries, Wages and Benefits - 2002 Survey Results, Western Mine Eng, Inc./weighted average for coal supervisor).

30 CFR Part 75, Section 75.512. The number of underground coal mining sections utilizing electric equipment is approximately 834 and averages 6 pieces of electrical equipment per mining section. The number of other pieces of underground electrical installations is approximately 4,682. This equipment is required to be examined weekly and the results of each examination are required to be recorded. It is estimated that each examination will take 30 minutes (0.50 hours) to conduct and 30 minutes (0.50 hours) to record. (NOTE: There is only one record made for each section of the mine or 6 pieces of equipment.)

Recordkeeping:
834 sections + 4,682 other elec. installations
x 50 weeks x 0.50 hour x 1 record/section of

mine = 137,900 hours

Examination time:
5,004 units of equip. + 4,682 other elec. installations x 50 weeks x 0.50 hour = 242,150 hours

Section 75.512 Burden Hours: **380,050 hours**
Section 75.512 Burden Costs: 380,050 hours x $58.96 = **$22,407,748**

Section 75.703-3 (d)(11). All grounding diodes shall be tested, examined and maintained as electrical equipment in accordance with the provisions of Part 75.512. Therefore Diode testing calculations are included as part of 30 CFR Part 75.512.

Section 77.502-2. The number of electrical installations at surface coal mines and surface facilities is approximately 22,606; these installations are required to be examined monthly and the results of each examination are required to be recorded. It is estimated that each examination will take 1 hour to complete and 15 minutes (0.25 hour) to record.

Recordkeeping:
22,606 exams x 12 months x 0.25 hours = 67,818 hours

Examination time:
22,606 elec. exams x 12 months x 1 hour = 271,272 hours

Where a standard requires a record to be kept, the examination time and the recording time are burden hours with no reductions for "certification" when no hazards are reported.

Section 77.502-2 Burden Hours: **339,090 hours**
Section 77.502-2 Burden Costs: 339,090 x $58.96 = **$19,992,746**

Examinations of High-Voltage Circuit Breakers

Sections 75.800-3 & 4 and 77.800-1 & 2. The number of circuit breakers protecting high-voltage circuits extending underground is approximately 834. The number of circuit breakers protecting high-voltage circuits extending to portable and mobile surface equipment is approximately 1765. Each circuit breaker is required to be examined and tested once a month and the results of each examination/test recorded. It is estimated that each examination will take 30 minutes (0.50 hours), and require 15 minutes (0.25 hour) to record the results.

Surface:

Recordkeeping:
1,765 circuit breaker x 12 months x 0.25 hour = 5,295 hours

Examination time:
1,765 circuit breakers x 12 months x 0.50 hour = 10,590 hours

Underground:

Recordkeeping:
834 circuit breakers x 12 months x 0.25 hour = 2,502 hours

Examination time:
834 circuit breakers x 12 months x 0.50 hour = 5,004 hours

Sections 75.800-3 & 4 and 77.800-1 & 2 Burden Hours: **23,391 hours**
Sections 75.800-3 & 4 and 77.800-1 & 2 Burden Costs:
23,391 x $58.96 = **$1,379,133**

Examinations of Low- and Medium-Voltage Circuit Breakers

Section 75.900-3 & 4. The number of power centers containing circuit breakers protecting low- and medium-voltage power circuits serving three-phase underground equipment is approximately 5,480. The circuit breakers in each such power center are required to be examined and tested once a month and the results of such examination/tests recorded. It is estimated that each examination/test will take 1 hour and require 30 minutes (0.50 hours) to record the results.

Recordkeeping:
5,480 power centers x 12 months x 0.50 hour = 32,880 hours

Examination time:
5,480 power centers x 12 months x 1 hour = 65,760 hours

Section 75.900-3 & 4 Burden Hours: **98,640 hours**
Section 75.900-3 & 4 Burden Costs: 98,640 hours x $58.96 = **$5,815,814**

Section 77.900-1 & 2. The number of installations containing

circuit breakers protecting low- and medium voltage alternating-current equipment located on the surface is approximately 1507. The circuit breakers in each such installation are required to be examined and tested once a month. It is estimated that each examination will take an average of 30 minutes (0.50 hours) to complete and 15 minutes (0.25 hours) to record the results.

Recordkeeping:
1,507 installations x 12 months x 0.25 hours = 4,521 hours

Examination time:
1,507 installations x 12 months x 0.50 hour = 9,042 hours

Section 77.900-1 & 2 Burden Hours: **13,563 hours**
Section 77.900-1 & 2 Burden Costs:13,563 hours x $58.96 = **$799,674**

Tests and Calibrations of Automatic Circuit Interrupting Devices

Section 75.1001-1(b) & (c). The number of trolley circuit breakers in underground coal mines is approximately 918. Each such circuit breaker is required to be tested and calibrated once every six months and the results of such tests and calibrations recorded. It is estimated that each test will take approximately 1 hour to complete and 30 minutes (0.50 hour) to record the results.

Recordkeeping:
918 trolley circuit breakers x 2 records per year x 0.50 hours = 918 hours

Examination time:
918 trolley circuit breakers x 2 examinations per year x 1 hour = 1,836 hours

Section 75.1001-1(b) & (c) Burden Hours: **2,754 hours**
Section 75.1001-1(b) & (c) Burden Costs: 2,754 hours x $58.96 = **$162,375.84**

Test and Calibration of Atmospheric Monitoring Systems

Sections 75.351 (f)(1), (2), (3), and (4) & (h). The number of atmospheric monitoring systems in underground coal mines is approximately 594. Each monitoring system is required to be tested and calibrated once every 31 days and the results of such tests and calibrations are required to be recorded. It is

estimated that each test/calibration will take 1 hour to complete and an average of 15 minutes (0.25 hour) to record the results.

Recordkeeping:
594 monitoring systems x 12 records per year x 0.25 hours = 1782 hours

Examination time:
594 monitor examinations x 12 calibrations per year x 1 hour = 7,128 hours

Sections 75.351 (f)(1),(2),(3), and (4) & (h)Burden Hours: **8,910 hours**
Sections 75.351 (f)(1),(2),(3), and (4) & (h)Burden Costs: 8,910 hours x $58.96 **= $525,333**

Table 2

Cite/ Reference	**Annual Burden Hours for Each Year**	**Annual Burden Costs for Each Year**
Section 75.512 and 75.703	380,050	$22,407,748
Section 77.502	339,090	$19,992,746
Section 75.800 and 77.800	23,391	$ 1,379,133
Sections 75.900	98,640	$ 5,815,814
Section 77.900	13,563	$ 799,674
Section 75.1001	2,754	$ 162,376
Section 75.351	8,910	$ 525,333
TOTAL	**866,398**	**$51,082,824**

GRAND TOTAL HOURS (Table 1 and Table 2): 871,604

GRAND TOTAL BURDEN COSTS (Table 1 and Table 2): $ 51,238,144

Cite/ Reference	Frequency	Total Responses	Response Time (Hours)	Burden Hours
18.53 (h)	Annual	3	1.1	3.3
75.820 (b) and (e)	Annual	17,500	.083	1,453
78.821 (d)	Annual	2,500	1.5	3,750
75.512 and 75.703 3(d)(11)	Weekly	760,100	0.5	380,050
77.502	Monthly	271,272	1.25	339,090
75.800-3&4 and 77.800- 1&2	Monthly	31,188	0.75	23,391
75.900 - 3&4	Monthly	65,760	1.5	98,640
77.900 - 1&2	Monthly	18,084	0.75	13,563
75.1001 - 1(b)&(c)	6 Months	1,836	1.5	2,754
75.351	Monthly	7,128	1.25	8,910
TOTAL		**1,175,371**		**871,604.3**

13. Provide an estimate of the total annual cost burden to respondents or recordkeepers resulting from the collection of information. (Do not include the cost of any hour burden shown in Items 13 and 15.)

- **The cost estimate should be split into two components: (a) a total capital and start-up cost component (annualized over its expected useful life); and (b) a total operation and maintenance and purchase of services component. The estimates should take into account costs associated with generating, maintaining, and disclosing or providing the information. Include descriptions of methods used to estimate major cost factors including system and technology acquisition, expected useful life of capital equipment, the discount rate(s), and the time period over which costs will be incurred. Capital and start-up costs include, among other items, preparations for collecting information such as purchasing computers and software; monitoring, sampling, drilling and testing equipment; and record storage facilities.**

- **If cost estimates are expected to vary widely, agencies should present ranges of cost burdens and explain the reasons for the variance. The cost of purchasing or**

contracting out information collection services should be a part of this cost burden estimate. In developing cost burden estimates, agencies may consult with a sample of respondents (fewer than 10), utilize the 60-day pre-OMB submission public comment process and use existing economic or regulatory impact analysis associated with the rulemaking containing the information collection, as appropriate.

- **Generally, estimates should not include purchases of equipment or services, or portions thereof, made: (1) prior to October 1, 1995, (2) to achieve regulatory compliance with requirements not associated with the information collection, (3) for reasons other than to provide information or keep records for the government, or (4) as part of customary and usual business or private practices.**

MSHA does not anticipate that there will be any costs associated with this information collection other than those designated under number 12 above.

14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information. Agencies also may aggregate cost estimates from Items 12, 13, and 14 in a single table.

There is no significant cost to the Federal Government. The Federal inspection costs associated with this specific information collection is minimal. The review/inspection of records is just one aspect of the annual inspection. Complete inspections are required under Section 103(a) of the Mine Act and are required 4 times a year for underground mines and twice a year for surface operations. Those inspections are routinely conducted by GS-12 Coal Mine Inspectors. The average grade and salary for a GS-12-5 Coal Mine inspector, is 61,704 per annum (2002 Base General Schedule) or $29.67 per hour.

15. Explain the reason for any program changes or adjustments reporting in Items 13 or 14 of the OMB Form 83-1.

The number of responses and burden hours decreased due to a decrease in the number of longwalls from 55 to 50.

16. For collections of information whose results will be published, outline plans for tabulation, and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

MSHA has no plans to publish the information obtained through this information collection.

17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

There are no forms associated with this request, therefore MSHA is not seeking approval to either display or not display the expiration date for OMB approval of this information collection.

18. Explain each exception to the certification statement identified in Item 19, "Certification for Paperwork Reduction Act Submission," of OMB 83-I.

There are no certification exceptions identified with this information collection.

B. Collection of Information Employment Statistical Methods

The agency should be prepared to justify its decision not to use statistical methods in any case where such methods might reduce burden or improve accuracy of results. When Item 17 on the Form OMB 83-I is checked "Yes", the following documentation should be included in the Supporting Statement to the extent that it applies to the methods proposed:

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a

whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

This collection of information does not employ statistical methods.

2. Describe the procedures for the collection of information including:

- **Statistical methodology for stratification and sample selection,**
- **Estimation procedure,**
- **Degree of accuracy needed for the purpose described in the justification,**
- **Unusual problems requiring specialized sampling procedures, and**
- **Any use of periodic (less frequently than annual) data collection cycles to reduce burden.**

3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.

4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s) or other person(s) who will actually collect and/or analyze the information for the agency.

A statistical analysis is not required by the regulation; questions 1 through 5 do not apply.

[Excerpts from the Mine Act 0f 1977]

Federal Mine Safety & Health Act of 1977, Public Law 91-173, as amended by Public Law 95-164

An Act

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That this Act may be cited as the "Federal Mine Safety and Health Act of 1977".

TITLE I--GENERAL
MANDATORY SAFETY AND HEALTH STANDARDS

SEC. 101. (a) The Secretary shall by rule in accordance with procedures set forth in this section and in accordance with section 553 of title 5, United States Code (without regard to any reference in such section to sections 556 and 557 of such title), develop, promulgate, and revise as may be appropriate, improved mandatory health or safety standards for the protection of life and prevention of injuries in coal or other mines.

(1) Whenever the Secretary, upon the basis of information submitted to him in writing by an interested person, a representative of any organization of employers or employees, a nationally recognized standards-producing organization, the Secretary of Health, Education, and Welfare, the National Institute for Occupational Safety and Health, or a State or political subdivision, or on the basis of information developed by the Secretary or otherwise available to him, determines that a rule should be promulgated in order to serve the objectives of this Act, the Secretary may request the recommendation of an advisory committee appointed under section 102(c). The Secretary shall provide such an advisory committee with any proposals of his own or of the Secretary of Health, Education, and Welfare, together with all pertinent factual information developed by the Secretary or the Secretary of Health, Education, and Welfare, or otherwise available, including the results of research, demonstrations, and experiments. An advisory committee shall submit to the Secretary its recommendations regarding the rule to be promulgated within 60 days from the date of its appointment or within such longer or shorter period as may be prescribed by the Secretary, but in no event for a period which is longer than 180 days. When the Secretary receives a recommendation, accompanied by appropriate criteria, from the National Institute for Occupational Safety and Health that a rule be promulgated, modified, or revoked, the Secretary must, within 60 days after receipt thereof, refer such recommendation to an advisory committee pursuant to this paragraph, or publish such as a proposed rule pursuant to paragraph (2), or publish in the

Federal Register his determination not to do so, and his reasons therefor. The Secretary shall be required to request the recommendations of an advisory committee appointed under section 102(c) if the rule to be promulgated is, in the discretion of the Secretary which shall be final, new in effect or application and has significant economic impact.

(2) The Secretary shall publish a proposed rule promulgating, modifying, or revoking a mandatory health or safety standard in the Federal Register. If the Secretary determines that a rule should be proposed and in connection therewith has appointed an advisory committee as provided by paragraph (1), the Secretary shall publish a proposed rule, or the reasons for his determination not to publish such rule, within 60 days following the submission of the advisory committee's recommendation or the expiration of the period of time prescribed by the Secretary in such submission. In either event, the Secretary shall afford interested persons a period of 30 days after any such publication to submit written data or comments on the proposed rule. Such comment period may be extended by the Secretary upon a finding of good cause, which the Secretary shall publish in the Federal Register. Publication shall include the text of such rules proposed in their entirety, a comparative text of the proposed changes in existing rules, and shall include a comprehensive index to the rules, cross-referenced by subject matter.

(3) On or before the last day of the period provided for the submission of written data or comments under paragraph (2), any interested person may file with the Secretary written objections to the proposed mandatory health or safety standard, stating the grounds therefor and requesting a public hearing on such objections. Within 60 days after the last day for filing such objections, the Secretary shall publish in the Federal Register a notice specifying the mandatory health or safety standard to which objections have been filed and a hearing requested, and specifying a time and place for such hearing. Any hearing under this subsection for the purpose of hearing relevant information shall commence within 60 days after the date of publication of the notice of hearing. Hearings required by this subsection shall be conducted by the Secretary, who may prescribe rules and make rulings concerning procedures in such hearings to avoid unnecessary cost or delay. Subject to the need to avoid undue delay, the Secretary shall provide for procedures that will afford interested parties the right to participate in the hearing, including the right to present oral statements and to offer written comments and data. The Secretary may require by subpoena the attendance of witnesses and the production of evidence in connection with any proceeding initiated under this section. If a person refuses to obey a subpoena under this subsection, a United States district court within the jurisdiction of which a proceeding under this subsection is conducted may, upon petition by the Secretary, issue an order requiring compliance with such subpoena. A transcript shall be taken of any such hearing and shall be available to the public.

(4)(A) Within 90 days after certification of the record of the hearing held pursuant to paragraph (3), the Secretary shall by rule promulgate, modify, or revoke such mandatory health or safety standards, and publish his reasons therefor.

(B) In the case of a proposed mandatory health or safety standard to which objections requesting a public hearing have not been filed, the Secretary, within 90 days after the period for filing such objections has expired, shall by rule promulgate, modify, or revoke such mandatory standards, and publish his reasons therefor.

(C) In the event the Secretary determines that a proposed mandatory health or safety standard should not be promulgated he shall, within the times specified in subparagraphs (A) and (B) publish his reasons for his determination.

(5) Any mandatory health or safety standard promulgated as a final rule under this section shall be effective upon publication in the Federal Register unless the Secretary specifies a later date.

(6)(A) The Secretary, in promulgating mandatory standards dealing with toxic materials or harmful physical agents under this subsection, shall set standards which most adequately assure on the basis of the best available evidence that no miner will suffer material impairment of health or functional capacity even if such miner has regular exposure to the hazards dealt with by such standard for the period of his working life. Development of mandatory standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the miner, other considerations shall be the latest available scientific data in the field, the feasibility of the standards, and experience gained under this and other health and safety laws. Whenever practicable, the mandatory health or safety standard promulgated shall be expressed in terms of objective criteria and of the performance desired.

(B) The Secretary of Health, Education, and Welfare, as soon as possible after the date of enactment of the Federal Mine Safety and Health Amendments Act of 1977 but in no event later than 18 months after such date and on a continuing basis thereafter, shall, for each toxic material or harmful physical agent which is used or found in a mine, determine whether such material or agent is potentially toxic at the concentrations in which it is used or found in a mine. The Secretary of Health, Education, and Welfare shall submit such determinations with respect to such toxic substances or harmful physical agents to the Secretary. Thereafter, the Secretary of Health, Education, and Welfare shall submit to the Secretary all pertinent criteria regarding any such substances determined to be toxic or any such harmful agents as such criteria are developed. Within 60 days after receiving any criteria in accordance with the preceding sentence relating to a toxic material or harmful physical agent which is not adequately covered by a mandatory health or safety standard promulgated under this section, the Secretary shall either appoint an advisory committee to make recommendations with respect to a mandatory health or safety standard covering such material or agent in accordance with paragraph (1), or publish a proposed rule promulgating such a mandatory health or safety standard in accordance with paragraph (2), or shall publish his determination not to do so.

(7) Any mandatory health or safety standard promulgated under this subsection shall prescribe the use of labels or other appropriate forms of warning as are necessary to insure that miners are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure. Where appropriate, such mandatory standard shall also prescribe suitable protective equipment and control or technological procedures to be used in connection with such hazards and shall provide for monitoring or measuring miner exposure at such locations and intervals, and in such manner so as to assure the maximum protection of miners. In addition, where appropriate, any such mandatory standard shall prescribe the type and frequency of medical examinations or other tests which shall be made available, by the operator at his cost, to miners exposed to such hazards in order to most effectively determine whether the health of such miners is adversely affected by such exposure. Where appropriate, the mandatory standard shall provide that where a determination is made that a miner may suffer material impairment of health or functional capacity by reason of exposure to the hazard covered by such mandatory standard, that miner shall be removed from such exposure and reassigned. Any miner transferred as a result of such exposure shall continue to receive compensation for such work at no less than the regular rate of pay for miners in the classification such miner held immediately prior to his transfer. In the event of the transfer of a miner pursuant to the preceding sentence, increases in wages of the transferred miner shall be based upon the new work classification. In the event such medical examinations are in the nature of research, as determined by the Secretary of Health, Education, and Welfare, such examinations may be furnished at the expense of the Secretary of Health, Education, and Welfare. The results of examinations or tests made pursuant to the preceding sentence shall be furnished only to the Secretary or the Secretary of Health, Education, and Welfare, and, at the request of the miner, to his designated physician.

(8) The Secretary shall, to the extent practicable, promulgate separate mandatory health or safety standards applicable to mine construction activity on the surface.

(9) No mandatory health or safety standard promulgated under this title shall reduce the protection afforded miners by an existing mandatory health or safety standard.

(b)(1) The Secretary shall provide, without regard to the requirements of chapter 5, title 5, United States Code, for an emergency temporary mandatory health or safety standard to take immediate effect upon publication in the Federal Register if he determines (A) that miners are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful, or to other hazards, and (B) that such emergency standard is necessary to protect miners from such danger.

(2) A temporary mandatory health or safety standard shall be effective until superseded by a mandatory standard promulgated in accordance with the procedures prescribed in paragraph (3) of this subsection.

(3) Upon publication of such standard in the Federal Register, the Secretary shall commence a proceeding in accordance with section 101 (a), and the standards as published shall also serve as a proposed rule for the proceeding. The Secretary shall promulgate a mandatory health or safety standard under this paragraph no later than nine months after publication of the emergency temporary standard as provided in paragraph (2).

(c) Upon petition by the operator or the representative of miners, the Secretary may modify the application of any mandatory safety standard to a coal or other mine if the Secretary determines that an alternative method of achieving the result of such standard exists which will at all times guarantee no less than the same measure of protection afforded the miners of such mine by such standard, or that the application of such standard to such mine will result in a diminution of safety to the miners in such mine. Upon receipt of such petition the Secretary shall publish notice thereof and give notice to the operator or the representative of miners in the affected mine, as appropriate, and shall cause such investigation to be made as he deems appropriate. Such investigation shall provide an opportunity for a public hearing at the request of such operator or representative or other interested party, to enable the operator or the representative of miners in such mine or other interested party to present information relating to the modification of such standard. Before granting any exception to a mandatory safety standard, the findings of the Secretary or his authorized representative shall be made public and shall be available to the representative of the miners at the affected mine. The Secretary shall issue a decision incorporating his findings of fact therein, and send a copy thereof to the operator or the representative of the miners, as appropriate. Any such hearing shall be of record and shall be subject to section 554 of title 5 of the United States Code.

(d) Any person who may be adversely affected by a mandatory health or safety standard promulgated under this section may, at any time prior to the sixtieth day after such standard is promulgated, file a petition challenging the validity of such mandatory standard with the United States Court of Appeals for the District of Columbia Circuit or the circuit wherein such person resides or has his principal place of business, for a judicial review of such standard. A copy of the petition shall be forthwith transmitted by the clerk of the court to the Secretary. The filing of such petition shall not, unless otherwise ordered by the court, operate as a stay of the standard. No objection that has not been urged before the Secretary shall be considered by the court, unless the failure or neglect to urge such objection shall be excused for good cause shown. The validity of any mandatory health or safety standard shall not be subject to challenge on the grounds that any of the time limitations in this section have been exceeded. The procedures of this subsection shall be the exclusive means of challenging the validity of a mandatory health or safety standard.

(e) The Secretary shall send a copy of every proposed mandatory health or safety standard or regulation at the time of publication in the Federal Register to the operator of each coal or other mine and the representative of the miners at such mine and such copy shall be immediately posted on the bulletin board of the mine by the operator or his agent, but failure to receive such notice shall not relieve anyone of the obligation to comply with such standard or regulation.

INSPECTIONS, INVESTIGATIONS, AND RECORDKEEPING

SEC. 103. (a) Authorized representatives of the Secretary or the Secretary of Health, Education, and Welfare shall make frequent inspections and investigations in coal or other mines each year for the purpose of (1) obtaining, utilizing, and disseminating information relating to health and safety conditions, the causes of accidents, and the causes of diseases and physical impairments originating in such mines, (2) gathering information with respect to mandatory health or safety standards, (3) determining whether an imminent danger exists, and (4) determining whether there is compliance with the mandatory health or safety standards or with any citation, order, or decision issued under this title or other requirements of this Act. In carrying out the requirements of this subsection, no advance notice of an inspection shall be provided to any person, except that in carrying out the requirements of clauses (1) and (2) of this subsection, the Secretary of Health, Education, and Welfare may give advance notice of inspections. In carrying out the requirements of clauses (3) and (4) of this subsection, the Secretary shall make inspections of each underground coal or other mine in its entirety at least four times a year, and of each surface coal or other mine in its entirety at least two times a year. The Secretary shall develop guidelines for additional inspections of mines based on criteria including, but not limited to, the hazards found in mines subject to this Act, and his experience under this Act and other health and safety laws. For the purpose of making any inspection or investigation under this Act, the Secretary, or the Secretary of Health, Education, and Welfare, with respect to fulfilling his responsibilities under this Act, or any authorized representative of the Secretary or the Secretary of Health, Education, and Welfare, shall have a right of entry to, upon, or through any coal or other mine.

(b) For the purpose of making any investigation of any accident or other occurrence relating to health or safety in a coal or other mine, the Secretary may, after notice, hold public hearings, and may sign and issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and administer oaths. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In case of contumacy or refusal to obey a subpoena served upon any person under this section, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person, shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Secretary or

to appear and produce documents before the Secretary, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

(c) The Secretary, in cooperation with the Secretary of Health, Education, and Welfare, shall issue regulations requiring operators to maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured under any applicable mandatory health or safety standard promulgated under this Act. Such regulations shall provide miners or their representatives with an opportunity to observe such monitoring or measuring, and to have access to the records thereof. Such regulations shall also make appropriate provisions for each miner or former miner to have access to such records as will indicate his own exposure to toxic materials or harmful physical agents. Each operator shall promptly notify any miner who has been or is being exposed to toxic materials or harmful physical agents in concentrations or at levels which exceed those prescribed by an applicable mandatory health or safety standard promulgated under section 101, or mandated under title II, and shall inform any miner who is being thus exposed of the corrective action being taken.

(d) All accidents, including unintentional roof falls (except in any abandoned panels or in areas which are inaccessible or unsafe for inspections), shall be investigated by the operator or his agent to determine the cause and the means of preventing a recurrence. Records of such accidents and investigations shall be kept and the information shall be made available to the Secretary or his authorized representative and the appropriate State agency. Such records shall be open for inspection by interested persons. Such records shall include man-hours worked and shall be reported at a frequency determined by the Secretary, but at least annually.

(e) Any information obtained by the Secretary or by the Secretary of Health, Education, and Welfare under this Act shall be obtained in such a manner as not to impose an unreasonable burden upon operators, especially those operating small businesses, consistent with the underlying purposes of this Act. Unnecessary duplication of effort in obtaining information shall be reduced to the maximum extent feasible.

(f) Subject to regulations issued by the Secretary, a representative of the operator and a representative authorized by his miners shall be given an opportunity to accompany the Secretary or his authorized representative during the physical inspection of any coal or other mine made pursuant to the provisions of subsection (a), for the purpose of aiding such inspection and to participate in pre- or post-inspection conferences held at the mine. Where there is no authorized miner representative, the Secretary or his authorized representative shall consult with a reasonable number of miners concerning matters of health and safety in such mine. Such representative of miners who is also an employee of the operator shall suffer no loss of pay during the period of his participation in the inspection made under this subsection. To the extent that the Secretary or authorized representative of the Secretary determines that more than one representative from each

party would further aid the inspection, he can permit each party to have an equal number of such additional representatives. However, only one such representative of miners who is an employee of the operator shall be entitled to suffer no loss of pay during the period of such participation under the provisions of this subsection. Compliance with this subsection shall not be a jurisdictional prerequisite to the enforcement of any provision of this Act.

(g)(1) Whenever a representative of the miners or a miner in the case of a coal or other mine where there is no such representative has reasonable grounds to believe that a violation of this Act or a mandatory health or safety standard exists, or an imminent danger exists, such miner or representative shall have a right to obtain an immediate inspection by giving notice to the Secretary or his authorized representative of such violation or danger. Any such notice shall be reduced to writing, signed by the representative of the miners or by the miner, and a copy shall be provided the operator or his agent no later than at the time of inspection, except that the operator or his agent shall be notified forthwith if the complaint indicates that an imminent danger exists. The name of the person giving such notice and the names of individual miners referred to therein shall not appear in such copy or notification. Upon receipt of such notification, a special inspection shall be made as soon as possible to determine if such violation or danger exists in accordance with the provisions of this title. If the Secretary determines that a violation or danger does not exist, he shall notify the miner or representative of the miners in writing of such determination.

(2) Prior to or during any inspection of a coal or other mine, any representative of miners or a miner in the case of a coal or other mine where there is no such representative, may notify the Secretary or any representative of the Secretary responsible for conducting the inspection, in writing, of any violation of this Act or of any imminent danger which he has reason to believe exists in such mine. The Secretary shall, by regulation, establish procedures for informal review of any refusal by a representative of the Secretary to issue a citation with respect to any such alleged violation or order with respect to such danger and shall furnish the representative of miners or miner requesting such review a written statement of the reasons for the Secretary's final disposition of the case.

(h) In addition to such records as are specifically required by this Act, every operator of a coal or other mine shall establish and maintain such records, make such reports, and provide such information, as the Secretary or the Secretary of Health, Education, and Welfare may reasonably require from time to time to enable him to perform his functions under this Act. The Secretary or the Secretary of Health, Education, and Welfare is authorized to compile, analyze, and publish, either in summary or detailed form, such reports or information so obtained. Except to the extent otherwise specifically provided by this Act, all records, information, reports, findings, citations, notices, orders, or decisions required or issued pursuant to or under this Act may be published from time to

time, may be released to any interested person, and shall be made available for public inspection.

(i) Whenever the Secretary finds that a coal or other mine liberates excessive quantities of methane or other explosive gases during its operations, or that a methane or other gas ignition or explosion has occurred in such mine which resulted in death or serious injury at any time during the previous five years, or that there exists in such mine some other especially hazardous condition, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine during every five working days at irregular intervals. For purposes of this subsection, "liberation of excessive quantities of methane or other explosive gases" shall mean liberation of more than one million cubic feet of methane or other explosive gases during a 24-hour period. When the Secretary finds that a coal or other mine liberates more than five hundred thousand cubic feet of methane or other explosive gases during a 24-hour period, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine every 10 working days at irregular intervals. When the Secretary finds that a coal or other mine liberates more than two hundred thousand cubic feet of methane or other explosive gases during a 24-hour period, he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine every 15 working days at irregular intervals.

(j) In the event of any accident occurring in any coal or other mine, the operator shall notify the Secretary thereof and shall take appropriate measures to prevent the destruction of any evidence which would assist in investigating the cause or causes thereof. In the event of any accident occurring in a coal or other mine, where rescue and recovery work is necessary, the Secretary or an authorized representative of the Secretary shall take whatever action he deems appropriate to protect the life of any person, and he may, if he deems it appropriate, supervise and direct the rescue and recovery activities in such mine.

(k) In the event of any accident occurring in a coal or other mine, an authorized representative of the Secretary, when present, may issue such orders as he deems appropriate to insure the safety of any person in the coal or other mine, and the operator of such mine shall obtain the approval of such representative, in consultation with appropriate State representatives, when feasible, of any plan to recover any person in such mine or to recover the coal or other mine or return affected areas of such mine to normal.

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TITLE 30--MINERAL RESOURCES

CHAPTER I--MINE SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 18--ELECTRIC MOTOR-DRIVEN MINE EQUIPMENT AND ACCESSORIES--Table of Contents

Subpart B--Construction and Design Requirements

Sec. 18.**53** High-voltage longwall mining systems.

(a) In each high-voltage motor-starter enclosure, with the exception of a controller on a high-voltage shearer, the disconnect device compartment, control/communications compartment, and motor contactor compartment must be separated by barriers or partitions to prevent exposure of personnel to energized high-voltage conductors or parts. In each motor-starter enclosure on a high-voltage shearer, the high-voltage components must be separated from lower voltage components by barriers or partitions to prevent exposure of personnel to energized high-voltage conductors or parts. Barriers or partitions must be constructed of grounded metal or nonconductive insulating board.

(b) Each cover of a compartment in the high-voltage motor-starter enclosure containing high-voltage components must be equipped with at least two interlock switches arranged to automatically deenergize the high-voltage components within that compartment when the cover is removed.

(c) Circuit-interrupting devices must be designed and installed to prevent automatic reclosure.

(d) Transformers with high-voltage primary windings that supply control voltages must incorporate grounded electrostatic (Faraday) shielding between the primary and secondary windings. The shielding must be connected to equipment ground by a minimum No. 12 AWG grounding conductor. The secondary nominal voltage must not exceed 120 volts, line to line.

(e) Test circuits must be provided for checking the condition of ground-wire monitors and ground-fault protection without exposing personnel to energized circuits. Each ground-test circuit must inject a primary current of 50 percent or less of the current rating of the grounding resistor through the current transformer and cause each corresponding circuit-interrupting device to open.

(f) Each motor-starter enclosure, with the exception of a controller on a high-voltage shearer, must be equipped with a disconnect device installed to deenergize all high-voltage power conductors extending from the enclosure when the device is in the ``open'' position.

(1) When multiple disconnect devices located in the same enclosure are used to satisfy the above requirement they must be mechanically connected to provide simultaneous operation by one handle.

(2) The disconnect device must be rated for the maximum phase-to-

phase voltage and the full-load current of the circuit in which it is located, and installed so that--

(i) Visual observation determines that the contacts are open without removing any cover;

(ii) The load-side power conductors are grounded when the device is in the ``open'' position;

(iii) The device can be locked in the ``open'' position;

(iv) When located in an explosion-proof enclosure, the device must be designed and installed to cause the current to be interrupted automatically prior to the opening of the contacts; and

(v) When located in a non-explosion-proof enclosure, the device must be designed and installed to cause the current to be interrupted automatically prior to the opening of the contacts, or the device must be capable of interrupting the full-load current of the circuit.

(g) Control circuits for the high-voltage motor starters must be interlocked with the disconnect device so that--

(1) The control circuit can be operated with an auxiliary switch in the ``test'' position only when the disconnect device is in the open and grounded position; and

(2) The control circuit can be operated with the auxiliary switch in the ``normal'' position only when the disconnect switch is in the closed position.

(h) A study to determine the minimum available fault current must be submitted to MSHA to ensure adequate

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protection for the length and conductor size of the longwall motor, shearer and trailing cables.

(i) Longwall motor and shearer cables with nominal voltages greater than 660 volts must be made of a shielded construction with a grounded metallic shield around each power conductor.

(j) High-voltage motor and shearer circuits must be provided with instantaneous ground-fault protection of not more than 0.125-amperes. Current transformers used for this protection must be of the single-window type and must be installed to encircle all three phase conductors.

(k) Safeguards against corona must be provided on all 4,160 voltage circuits in explosion-proof enclosures.

(l) The maximum pressure rise within an explosion-proof enclosure containing high-voltage switchgear must be limited to 0.83 times the design pressure.

(m) High-voltage electrical components located in high-voltage explosion-proof enclosures must not be coplanar with a single plane flame-arresting path.

(n) Rigid insulation between high-voltage terminals (Phase-to-Phase or Phase-to-Ground) must be designed with creepage distances in accordance with the following table:

Minimum Creepage Distances	
Minimum creepage distances (inches) for comparative tracking index (CTI) range \1\	Points of

Phase to phase voltage	measure	CTI[ge]500	380[le]CTI<500	175[le]CTI<380	CTI<175
2,400	0-0	1.50	1.95	2.40	2.90
	0-G	1.00	1.25	1.55	1.85
4,160	0-0	2.40	3.15	3.90	4.65
	0-G	1.50	1.95	2.40	2.90

\1\ Assumes that all insulation is rated for the applied voltage or higher.

(o) Explosion-proof motor-starter enclosures must be designed to establish the minimum free distance (MFD) between the wall or cover of the enclosure and uninsulated electrical conductors inside the enclosure in accordance with the following table:

High-Voltage Minimum Free Distances (MFD)

Aluminum MFD (in) Wall/cover thickness (in)			Steel MFD (in)		
			A \1\	B \2\	C \3\
A	B	C			
\1/4\			2.8	4.3	5.8
\4\ NA	\4\ NA	\4\ NA			
\3/8\			1.8	2.3	3.9
8.6	12.8	18.1			
\1/2\			* 1.2	2.0	2.7
6.5	9.8	13.0			
\5/8\			* 0.9	1.5	2.1
5.1	7.7	10.4			
\3/4\			* 0.6	* 1.1	1.6
4.1	6.3	8.6			
1			(*)	* 0.6	* 1.0
2.9	4.5	6.2			

Note *: The minimum electrical clearances must still be maintained.
\1\ Column A specifies the MFD for enclosures that have available 3-phase bolted short-circuit currents of 10,000 amperes rms or less.
\2\ Column B specifies the MFD for enclosures that have a maximum available 3-phase bolted short-circuit

currents greater than 10,000 and less than or equal to 15,000 amperes rms.
\3\ Column C specifies the MFD for enclosures that have a maximum available 3-phase bolted short-circuit
currents greater than 15,000 and less than or equal to 20,000 amperes rms.
\4\ Not Applicable--MSHA doesn't allow aluminum wall or covers to be \1/4\ inch or less in thickness (Section
18.31).

(1) For values not included in the table, the following formulas on which the table is based may be used to determine the minimum free distance.
(i) Steel Wall/Cover:

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[GRAPHIC] [TIFF OMITTED] TR11MR02.001

(ii) Aluminum Wall/Cover:
[GRAPHIC] [TIFF OMITTED] TR11MR02.002

Where C is 1.4 for 2,400 volt systems or 3.0 for 4,160 volt systems, I<INF>sc</INF> is the 3-phase short circuit current in amperes of the system, t is the clearing time in seconds of the outby circuit-interrupting device and d is the thickness in inches of the metal wall/cover adjacent to an area of potential arcing.
(2) The minimum free distance must be increased by 1.5 inches for 4,160 volt systems and 0.7 inches for 2,400 volt systems when the adjacent wall area is the top of the enclosure. If a steel shield is mounted in conjunction with an aluminum wall or cover, the thickness of the steel shield is used to determine the minimum free distances.
(p) The following static pressure test must be performed on each prototype design of explosion-proof enclosures containing high-voltage switchgear prior to the explosion tests. The static pressure test must also be performed on every explosion-proof enclosure containing high-voltage switchgear, at the time of manufacture, unless the manufacturer uses an MSHA accepted quality assurance procedure covering inspection of the enclosure. Procedures must include a detailed check of parts against the drawings to determine that the parts and the drawings coincide and that the minimum requirements stated in part 18 have been followed with respect to materials, dimensions, configuration and workmanship.
(1) Test procedure. (i) The enclosure must be internally pressurized to at least the design pressure, maintaining the pressure for a minimum of 10 seconds.
(ii) Following the pressure hold, the pressure must be removed and the pressurizing agent removed from the enclosure.
(2) Acceptable performance. (i) The enclosure during pressurization must not exhibit--
(A) Leakage through welds or casting; or
(B) Rupture of any part that affects the explosion-proof integrity of the enclosure.
(ii) The enclosure following removal of the pressurizing agents must not exhibit--
(A) Visible cracks in welds;

(B) Permanent deformation exceeding 0.040 inches per linear foot; or

(C) Excessive clearances along flame-arresting paths following retightening of fastenings, as necessary.

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TITLE 30--MINERAL RESOURCES

CHAPTER I--MINE SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 75--MANDATORY SAFETY STANDARDS--UNDERGROUND COAL MINES--Table of Contents

Subpart D--Ventilation

Sec. 75.**351** Atmospheric monitoring system (AMS).

(a) Minimum requirements. An AMS shall consist of sensors to monitor the mine atmosphere and instruments at a surface location designated by the operator to receive information from the monitoring sensors. Each AMS installed in accordance with Secs. 75.323(d)(1)(ii), 75.340(a)(2) and 75.362(f) shall do the following:

(1) Monitor for circuit continuity and sensor function, and identify at the designated surface location any activated or malfunctioning sensor.

(2) Signal a designated surface location at the mine when any interruption of circuit continuity occurs or any sensor malfunctions.

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(3) Signal affected working sections and the designated surface location when--

(i) The carbon monoxide concentration at any carbon monoxide sensor reaches 5 parts per million above the established ambient level for that area; or

(ii) The methane concentration at any methane monitoring station exceeds the maximum allowable concentration as specified for that location in Sec. 75.323.

(4) Activate alarms at a designated surface location and affected working sections when the carbon monoxide concentration at any carbon monoxide sensor reaches 10 parts per million above the established ambient level for the area or when the optical density of smoke at any smoke sensor reaches 0.05 per meter.

(b) Return splits. (1) If used to monitor return air splits under Sec. 75.362(f), AMS sensors shall monitor the mine atmosphere for percentage of methane in each return split of air from each working

section between the last working place, or longwall or shortwall face, ventilated by that air split and the junction of that return air split with another air split, seal, or worked-out area. If auxiliary fans and tubing are used, the sensor also shall be located outby the auxiliary fan discharge.

(2) If used to monitor air splits under Sec. 75.323(d)(1)(ii), AMS sensors shall monitor the mine atmosphere at the following locations:

(i) In the return air course opposite the section loading point or, if auxiliary fans and tubing are used, in the return air course outby the auxiliary fans and a point opposite the section loading point.

(ii) Immediately inby the location where the split of air meets another split of air, or inby the location where the split of air is used to ventilate seals or worked-out areas.

(c) Electrical installations. If used to monitor the intake air ventilating underground transformer stations, battery charging stations, substations, rectifiers, or water pumps under Sec. 75.340(a)(2), at least one sensor shall be installed to monitor the mine atmosphere for carbon monoxide or smoke at least 50 feet and no more than 100 feet downstream in the direction of air flow.

(d) Signals and alarms. (1) A person designated by the operator shall be at a surface location where the signals and alarms from the AMS can always be seen or heard while anyone is underground. This person shall have access to two-way communication with working sections and with other identifiable duty stations underground. A mine map showing the underground monitoring system shall be posted at the surface location.

(2) If a signal from any AMS sensor is activated, the monitor producing the signal shall be identified, an examination shall be made to determine the cause of the activation, and appropriate action shall be taken.

(e) Sensors. (1) Each carbon monoxide sensor shall be capable of detecting carbon monoxide in air at a level of [plusmn]1 part per million throughout the operating range.

(2) Each methane sensor shall be capable of detecting 1.0 percent methane in air with an accuracy of [plusmn]0.2 percent methane.

(3) Each smoke sensor shall be capable of detecting the optical density of smoke with an accuracy of [plusmn]0.005 per meter.

(f) Testing and calibration. At least once every 31 days--

(1) Each carbon monoxide sensor shall be calibrated with a known concentration of carbon monoxide and air sufficient to activate an alarm;

(2) Each smoke sensor shall be functionally tested;

(3) Each methane sensor shall be calibrated with a known methane-air mixture; and

(4) Each oxygen sensor shall be calibrated with air having a known oxygen concentration.

(g) Intrinsic Safety. Components of AMS installed in areas where permissible equipment is required shall be intrinsically safe.

(h) Recordkeeping. If a signal device or alarm is activated, a record shall be made of the date, time, type of sensor, and the reason for its activation. Also the maximum concentration detected at the sensor producing the signal shall be recorded.

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(i) Retention period. Records shall be retained for at least 1 year

at a surface location at the mine and made available for inspection by authorized representatives of the Secretary and representatives of miners.

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Subpart F--Electrical Equipment--General

Sec. 75.**512** Electric equipment; examination, testing and maintenance.

[Statutory Provision]

All electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept and made available to an authorized representative of the Secretary and to the miners in such mine.

[35 FR 17890, Nov. 20, 1970, as amended at 60 FR 33723, June 29, 1995]

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Subpart H--Grounding

Sec. 75.**703** Grounding offtrack direct-current machines and the enclosures of related detached components.

[Statutory Provisions]

The frames of all offtrack direct-current machines and the enclosures of related detached components shall be effectively grounded, or otherwise maintained at no less safe voltages, by methods approved by an authorized representative of the Secretary.

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Subpart I--Underground High-Voltage Distribution

Sec. 75.**800** High-voltage circuits; circuit breakers.

[Statutory Provisions]

High-voltage circuits entering the underground area of any coal mine shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against under-voltage grounded phase, short circuit, and overcurrent.

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Subpart I--Underground High-Voltage Distribution

Sec. 75.**820** Electrical work; troubleshooting and testing.

(a) Electrical work on all circuits and equipment associated with high-voltage longwalls must be performed only by persons qualified under Sec. 75.153 to perform electrical work on all circuits and equipment.

(b) Prior to performing electrical work, except for troubleshooting and testing of energized circuits and equipment as provided for in paragraph (d) of this section, a qualified person must do the following:

(1) Deenergize the circuit or equipment with a circuit-interrupting device.

(2) Open the circuit disconnecting device. On high-voltage circuits, ground the power conductors until work on the circuit is completed.

(3) Lock out the disconnecting device with a padlock. When more than one qualified person is performing work, each person must install an individual padlock.

(4) Tag the disconnecting device to identify each person working and the circuit or equipment on which work is being performed.

(c) Each padlock and tag must be removed only by the person who installed them, except that, if that person is unavailable at the mine, the lock and tag may be removed by a person authorized by the operator, provided--

(1) The authorized person is qualified under paragraph (a) of this section; and

(2) The operator ensures that the person who installed the lock and tag is aware of the removal before that person resumes work on the affected circuit or equipment.

(d) Troubleshooting and testing of energized circuits must be performed only--

(1) On low- and medium-voltage circuits;

(2) When the purpose of troubleshooting and testing is to determine voltages and currents; and

(3) By persons qualified to perform electrical work and who wear protective gloves on circuits that exceed 40 volts in accordance with the following table:

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Circuit voltage	Type of glove required
Greater than 120 volts (nominal) (not intrinsically safe).	Rubber insulating gloves with leather protectors.
40 volts to 120 volts (nominal) (both intrinsically safe and non-intrinsically safe).	Either rubber insulating gloves with leather protectors or dry work gloves.
Greater than 120 volts (nominal) (intrinsically safe).	Either rubber insulating gloves with leather protectors or dry work gloves.

(4) Rubber insulating gloves must be rated at least for the nominal voltage of the circuit when the voltage of the circuit exceeds 120 volts nominal and is not intrinsically safe.

(e) Before troubleshooting and testing a low- or medium-voltage circuit contained in a compartment with a high-voltage circuit, the high-voltage circuit must be deenergized, disconnected, grounded, locked out and tagged in accordance with paragraph (b) of this section.

(f) Prior to the installation or removal of conveyor belt structure, high-voltage cables extending from the section power center to longwall equipment and located in the belt entries must be:

(1) Deenergized; or

(2) Guarded in accordance with Sec. 75.816 of this part, at the location where the belt structure is being installed or removed; or

(3) Located at least 6.5 feet above the mine floor.

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Subpart I--Underground High-Voltage Distribution

Sec. 75.**821** Testing, examination and maintenance.

(a) At least once every 7 days, a person qualified in accordance with Sec. 75.153 to perform electrical work on all circuits and equipment must test and examine each unit of high-voltage longwall equipment and circuits to determine that electrical protection, equipment grounding, permissibility, cable insulation, and control devices are being properly maintained to prevent fire, electrical shock, ignition, or operational hazards from existing on the equipment. Tests must include activating the ground-fault test circuit as required by Sec. 75.814(c).

(b) Each ground-wire monitor and associated circuits must be examined and tested at least once each 30 days to verify proper operation and that it will cause the corresponding circuit-interrupting device to open.

(c) When examinations or tests of equipment reveal a fire, electrical shock, ignition, or operational hazard, the equipment must be removed from service immediately or repaired immediately.

(d) At the completion of examinations and tests required by this section, the person who makes the examinations and tests must certify by signature and date that they have been conducted. A record must be made of any unsafe condition found and any corrective action taken. Certifications and records must be kept for at least one year and must be made available for inspection by authorized representatives of the Secretary and representatives of miners.

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Subpart J--Underground Low- and Medium-Voltage Alternating Current Circuits

Sec. 75.**900** Low- and medium-voltage circuits serving three-phase alternating current equipment; circuit breakers.

[Statutory Provisions]

Low- and medium-voltage power circuits serving three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against undervoltage, grounded phase, short circuit, and overcurrent.

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Subpart K--Trolley Wires and Trolley Feeder Wires

Sec. 75.**1001**-1 Devices for overcurrent protection; testing and calibration requirements; records.

(a) Automatic circuit interrupting devices that will deenergize the affected circuit upon occurrence of a short circuit at any point in the system will meet the requirements of Sec. 75.**1001**.

(b) Automatic circuit interrupting devices described in paragraph (a) of this section shall be tested and calibrated at intervals not to exceed six months. Testing of such devices shall include passing the necessary amount of electric current through the device to cause activation. Calibration of such devices shall include adjustment of all associated relays to [plusmn]15 percent of the indicated value. An authorized representative of the Secretary may require additional testing or calibration of these devices.

(c) A record of the tests and calibrations required by paragraph (b) of this section shall be kept, and shall be made available, upon request, to an authorized representative of the Secretary.

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PART 77--MANDATORY SAFETY STANDARDS, SURFACE COAL MINES AND SURFACE WORK AREAS OF UNDERGROUND COAL MINES--Table of Contents

Subpart F--Electrical Equipment--General

Sec. 77.**502** Electric equipment; examination, testing, and maintenance.

Electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept.

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Subpart F--Electrical Equipment--General

Sec. 77.**502** Electric equipment; examination, testing, and maintenance.

Electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept.

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Subpart J--Low- and Medium-Voltage Alternating Current Circuits

Sec. 77.**900** Low- and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers.

Low- and medium-voltage circuits supplying power to portable or mobile three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained and equipped with devices to provide protection against undervoltage, grounded phase, short circuit, and over-current.